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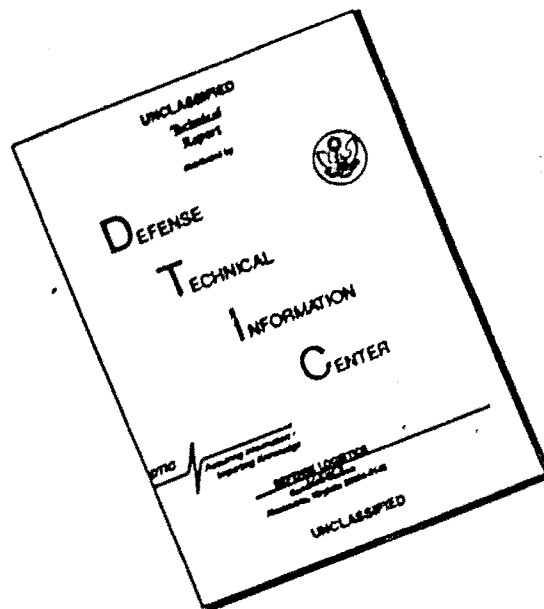
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DEPARTMENT OF THE ARMY

OFFICE OF THE ADJUTANT GENERAL

WASHINGTON, D.C. 20310



IN REPLY REFER TO  
AGAM-P (M)

(24 Apr 68) FOR OT RD 681276

29 April 1968

SUBJECT: Operational Report - Lessons Learned, Headquarters, 14th  
Engineer Battalion (Cbt)(A), Period Ending 31 January 1968 (U)

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*Staff for Force Development. FDR-OTRD. Wash. D.C. 20310*

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2. Information contained in this report is provided to insure appropriate benefits in the future from lessons learned during current operations and may be adapted for use in developing training material.

BY ORDER OF THE SECRETARY OF THE ARMY:

*Kenneth G. Wickham*

KENNETH G. WICKHAM  
Major General, USA  
The Adjutant General

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DEPARTMENT OF THE ARMY  
HEADQUARTERS, 14TH ENGINEER BATTALION (COMBAT) (ARMY)  
APO 96377

EGACBA-C

31 January 1968

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65) for  
Quarterly Period Ending 31 January 1968

THRU: Commanding Officer  
35th Engineer Group (Const)  
APO 96312

Commanding General  
18th Engineer Brigade  
ATTN: AVBU-C  
APO 96377

Commanding General  
U.S. Army Engineer Command Vietnam (Prov)  
ATTN: AVCC-P&O  
APO 96491

Commanding General  
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United States Army, Pacific  
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Department of the Army (ACSFOR DA)  
Washington, D.C. 20310

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EGACBA-C

31 January 1968

SUBJECT: Operational Report-~~Learned~~ Learned (NCS CSFOR-65) for  
Quarterly Period Ending 31 January 1968

## Section 1. Significant Organization or Unit Activities.

This ORIL is the fifth report submitted by the 14th Engineer Battalion (Combat) (Army) since its arrival in the Republic of Vietnam in October 1966. This report covers the major activities of the battalion during the three month period ending with January 1968.

### A. COMMAND:

During the quarter the battalion was commanded by:

LTC James L. Lammie	1 Nov - 14 Jan
MAJ Daniel A. Gale	15 Jan - 16 Jan
LTC Bennett L. Lewis	17 Jan - to present

### B. PERSONNEL, ADMINISTRATION, MORALE, AND DISCIPLINE:

During this period the battalion experienced no abnormal losses, gains, or personnel turbulence. The strength picture improved as 142 enlisted and 5 officer replacements were received against 115 enlisted and 5 officer losses. There is still a critical shortage of key NCO's in squad leader (E-6) and assistant squad leader (E-5) positions. At the end of January the battalion was short 118 E-5's and 6 E-6's. This deficiency could become more critical as 2 E-6's and 4 E-5's are scheduled to depart during February. The morale of the battalion continues at a very high level with no abnormal disciplinary problems.

### C. INTELLIGENCE:

During this quarter the S-2 conducted deliberate reconnaissance of Route 408 which is to be used as a bypass around the city of Phan Rang.

Deliberate reconnaissances were conducted on seven airfields in the II CTZ, completing the program on all secure airfields in the zone. Project folders which have been prepared on each airfield will allow more rapid planning and mobilization of assets should repair or upgrade of these fields be required. Staff visits were made to the outlying companies and included meetings with MACV intelligence personnel at each location. As a result, more timely intelligence on certain areas is now available to the battalion. The S-2 reconnaissance officers continued to be used as S-3 project officers to coordinate project requirements with the companies, battalion staff sections, and using agencies.

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## D. PLANS, OPERATIONS AND TRAINING:

At the beginning of November, the battalion was engaged in 19 active projects, 12 minor tasks, and 2 operational support missions with elements stationed in 8 locations in the southern half of the II Corps Tactical Zone. During this reporting period, 8 separate platoon and company moves were made and on 31 January the battalion's companies were located at Phan Thiet, Duc Trong, Phan Rang, and Dong Ba Thin while platoons or squads were stationed at Bao Loc, Song Pha, and Lang Bian Mountain. The dispersion of the battalion continues to require special measures of command, control, administration, and logistic support at both the company and battalion level. Is only one of the six locations mentioned above can be reached by secure roads, heavy dependence was placed on aircraft for movement of personnel, critical supplies, and inspection visits. Periodic road openings and tactical convoys were developed, some in conjunction with tactical operations, to provide the necessary bulk supplies for projects.

During the quarter A Company conducted 84 days of operations while 8 days were spent in training, maintenance, and holidays. At the start of the quarter the company was located at Ninh Hoa where it was primarily engaged in maintenance of National Highway QL-1 from Dien Khanh, HL-1 Nha Trang Bypass (west of Nha Trang) to Vung Ro Bay and in restoration and upgrading of QL-1 from Ninh Hoa to Vung Ro Bay. Maintenance projects included repair and replacement of bridge abutments damaged by flooding and filling potholes with cold mix asphaltic concrete. Upgrading of QL-1 consisted of work on three different bridges. Forms and reinforcing steel were placed for the abutments of one MACV Standard Type I bridge and two (2) timber trestle bridges were completed, one of which has 15 spans with an overall length of 270 feet rated at Class 50. Other projects in Ninh Hoa included support of the 9th Republic of Korea Division Headquarters with equipment and technical advice; assistance to an 8" Howitzer Artillery battery in constructing permanent pads for gun emplacements; and initiation of Minimum Essential Requirement (MER) construction for an Assault Helicopter Company. On 6 November the second platoon convoyed to Phan Rang. Their mission was to provide engineer support to the 3rd Battalion, 506th Infantry (Abn), 1st Bde, 101st Airborne Division during Operation Rose from 11-30 November. Tasks accomplished during the operation included daily mine sweeps, culvert installation, and construction of bypasses around destroyed bridges. On 13 November the third platoon convoyed to Dalat where they assumed responsibility for the maintenance of the civilian/military Cam Ly Airfield; construction of four (4) O-1 aircraft revetments; and work on the road and signal cantonment on Lang Bian Mountain. On 1 Dec 67 the company Hq and first platoon relocated to Phan Rang and immediately began the task of opening and maintaining

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Route QL-1 from Phan Rang South to Song Mao. The route was opened to a minimum Class 18, prior to Christmas. In addition the company was assigned responsibility for maintenance and upgrading of Route QL-11 from Phan Rang to Dalat. Tasks accomplished under this directive included the redecking of a 859 foot combination railroad/highway bridge; bypassing two bridges destroyed by the enemy; repair of severe road damage caused by water from ruptured power plant penstocks and the construction of one 40' steel stringer, timber deck, bridge. This is the first in a series of approximately 8 bridges to be constructed in the near future for upgrading the road to Class 35. A copy of the after action report on the repair of the penstock washout is attached as inclosure 1.

B Company conducted 86 days of operations and spent 6 days on training, maintenance, and holidays. The company headquarters and first platoon, located at Bao Loc, completed a C130 capable airfield on 1 Dec 67. Work was then initiated on a Forward Support Area (FSA) and Forward Area Support Heliport (FASH) involving the clearing of about 74,000 square yards of land. At Dalat the third platoon continued maintenance of the civilian/military Cam Ly Airfield, construction of O-1 revetments, improving the drainage system, and dust palliation. The second platoon continued expansion of the cantonment area at the Lang Bian Mountain signal relay facility. Work on Lang Bian included substantial completion of a mess hall extension; hauling and leveling of fill in preparation for construction of a 20'x 180' building and maintenance of the mountain access road. On 19 and 20 November the second and third platoons moved by tactical convoy to the village of Dai Quay to commence needed repair of Route QL-20 from vicinity of Dai Quay to the II/III Corps Tactical Zone (CTZ) boundary. This project was a joint effort with Vietnamese Army Engineers. Drainage structures were improved and a rock sand base course was placed to make the road passable to civilian traffic. In total 17 KM were improved. A copy of the after action report is attached as inclosure 2. It is significant that noticeable lowering of prices of fresh vegetables in the Saigon area can be directly attributed to this project. Both platoons relocated to Bao Loc on 11 December.

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On 6 December, B Company was tasked to provide direct support to the 1st Bde, 101st Airborne Division's operation Klamath Falls. Support continued until the operation was terminated on 13 January. The complete after action report, detailing tasks, accomplishments, and lessons learned is attached as Inclosure 3. On 4 January the company headquarters, 1st and 2nd platoons moved by tactical convoy to Duc Trong to establish a new base camp adjacent to an ARVN Training Center, from which projects in the Dalat area and on Routes QL-20 and 21A could be supported. As no facilities existed at the site, most of the remainder of the month was spent constructing bunkers, sniper berm, defensive wire, and tent frames. On 23 January one squad moved to Dalat where it installed the pump, chlorinator, pipe, and switches required to complete development of a 180' deep well. The project was completed on 27 January. The squad then moved to the Lang Bian Mountain Signal Relay facility where it began assembling culvert to be used in improving the drainage system on the mountain access road.

C Company conducted 84 days of operations and spent 6 days on training, maintenance, and holidays. For the majority of the quarter, C Company was in support of the 2/7 Cavalry, 1st Cavalry Division and was stationed at Phan Thiet. Construction of a POL storage facility consisting of two 3000 bbl and three 500 bbl tanks with 4800 feet of 4 inch pipeline was completed in early November. The system is now fully operational. During the quarter the 2/7 Cav was involved in two operations: Operation Byrd, from 1 November to 30 November, and 9 January to 20 January; and Operation Klamath Falls from 1 December to 8 January 1968 during which they were OPCON to the 1st Brigade, 101st Airborne Division. Tasks performed in support of Operation Byrd included construction of perimeter bunkers on Phan Thiet Airfield; continuous penepriming of helicopter landing areas, refueling areas, roads, and drainage ditches; revetment construction for both helicopters and fixed wing aircraft; construction of tropical wood design (TWD) buildings; and providing combat demolition teams for tactical operations. On 19 December one squad of engineers and a platoon of infantry air assaulted a hilltop south of Phan Thiet and began construction of permanent fortifications. The fort was completed in 9 days and included five 8 x 10 foot bunkers; one 10 x 10 foot command bunker; a lookout tower; a 1200 meter band of defensive wire; and a helipad. Work accomplished in support of Operation Klamath Falls is listed in the after action report attached as Inclosure 4. On 3 January the second platoon moved approximately 30 KM South of

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Phan Thiet over the II/III CTZ border to install extensive defensive wire consisting of 1500 meters of triple standard concertina, and 1800 meters of double apron fence around two Bailey Bridges. Work was completed on 20 January.

On 20 January Operation Byrd was terminated. The 2/7 Cav was replaced by the 3rd Battalion, 506th Infantry, 1st Brigade, 101st Airborne Division and Operation Mc Clain began on 21 January. Operational Support tasks have not changed significantly.

The first MACV Standard Type II bridge constructed by the battalion was started on 19 December by the 1st platoon and was 96% complete and open for light traffic at the end of the quarter. The two lane bridge is 106 feet long containing 6 timber pile bents. Other work on route QL1 included repair of 7 culverts, 4 of which had been destroyed by the enemy; reinforcement of an Eiffel Bridge as protection against floods; construction of 3 bypasses around destroyed bridges which completed the opening of QL-1 from Phan Rang to the II/III CTZ boundary; and maintenance of several bypasses around destroyed bridges. At the end of the quarter the first platoon was preparing to start construction of the 306 foot timber trestle bypass bridge in Phan Thiet. This bridge will allow military and civilian traffic up to class 50 to pass through Phan Thiet. At present the bridge in Phan Thiet has a load limit of Class 18. Designs have also been approved for two MACV Standard Type I bridges to be constructed south of Phan Thiet on QL-1.

D Company conducted 85 days of operations and spent 5 days on training, maintenance and holidays. At the beginning of the quarter the company was located on Cam Ranh Peninsula with responsibility for the battalion's projects in the Cam Ranh and Dong Ba Thin area. During the first 15 days of November, D Company with assistance from elements of A and Headquarters Companies completed construction of 16 revetments for CH47 aircraft. Since this was an MER project it was necessary to work a two shift operation to meet the required completion date. The revetment was designed to utilize readily available standard construction materials, in prefabricated panels which could be easily erected on the job site. Copy of revetment design is included as inclosure 5. The first platoon spent the majority of the quarter working on the 4000 Man Replacement Center at Cam Ranh where it completed construction of the Officer's Club less installation of kitchen equipment. Work remaining on this project includes wiring and plumbing in two mess halls and minor

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electrical work in billets. The major project for the second platoon was the construction of a 2000 KW generator plant at Dong Ba Thin. The plant contains four 500 KW generator enclosed in 45 x 96 foot building. On 31 January the project was 85% complete with only the installation of a fuel storage system remaining. When connected this facility will provide power for the entire Dong Ba Thin area. In addition to the power plant the second platoon was given an operational support mission to install a 70 foot single single Bailey Bridge to replace an intermediate span on an existing Eiffel Bridge, which had collapsed. The bridge could not be constructed in the usual manner. Each truss had to be lifted in to place individually using a crane, after which the transoms were also placed with the crane. Despite the technical difficulties encountered, the bridge was completed in 2 days. The third platoon completed a Tactical Operations Center (TOC) complex for 18th Engineer Brigade which included billets, mess hall, latrine, and shower in addition to the TOC structure. Additional projects included construction of UH-1D revetments; pouring the concrete pad for a 40 x 126 foot aircraft maintenance hangar. Technical supervision and equipment were provided for the self-help construction of several buildings and aircraft revetments. In order to be closer to its work sites the company relocated to Dong Ba Thin on 27 November 1967.

The 1st Platoon, 553rd Engineer Company (FB) was attached to this battalion during the entire quarter, with the mission of maintaining the My Ca Float Bridge connecting Cam Ranh peninsula with the mainland. The bridge is 1155 feet long, Class 45, employing a Class 60 super-structure supported by a combination of 24 ten pneumatic floats and M4 aluminum pontons.

During the second week of November typhoon warnings were received for the Cam Ranh area. In order to prevent serious damage, the bridge was broken into eight sections which were towed to shore and anchored to the beach. This task was accomplished on 10 November by the 1st Platoon, 553 and elements of D Company, 11th Engr Bn. The bridge was reassembled in 10 hours on the night of 11-12 November. Reassembly was delayed until high tide as the previous tide, influenced by the typhoon, had driven the sections high onto the beach. Even then it required the assistance of an LCM provided by the 497th Engineer Company (FC) to refloat a majority of the sections. By working all night, however, the bridge was opened prior to the arrival of the daily transportation supply convoys.

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The twelve bridge trucks assigned to the platoon continue to be used extensively to haul supplies and support unit moves. Without this capability the battalion's operations would have been severely hampered in many locations, as Transportation Corps assets are not always available for the timely movement of required supplies.

The 1st platoon of the 572nd Engineer Company (IE) was attached to the battalion during the entire quarter. The platoon's equipment has been used to reinforce the battalion's organic equipment on projects throughout the battalion area. As a part of the program to reduce potential ambush sites, the platoon was tasked in mid December to clear vegetation along QL-1 from Phan Rang north to Ba Ngoi. The area to be cleared extended 100 meters on both sides of the road. Equipment used included one D7E dozer with Roma Plow blade and one D7E with straight blade. Work started on 20 December and was temporarily halted on 26 January. Two hundred ninety acres were cleared during this period. On 4 January one section of eight dozers with Roma Plow blades from the 35th Engr Bn Land Clearing Platoon was attached to the battalion with the mission of clearing 100 meters on either side of Route QL-1 from Phan Thiet north to Phan Rang. They were placed under the operational control of the 572nd platoon leader who augmented the team with two dozers with straight blades from his platoon. Clearing actually began on 9 January and by the end of the quarter 2620 acres had been cleared with the task 90% complete. An average of 175 acres per day were cleared by the 10 dozer team.

At the beginning of the quarter the 551st Well Drilling Detachment was at Ninh Hoa drilling a well in the 9th Republic of Korea Army Division area. A thick layer of granite was encountered at a depth of 70 feet. At this time a study by US Army Engineer Command, Vietnam indicated that the well would never produce sufficient water to be useful and drilling was halted. On 6 November the 551st was released from attachment to the battalion and departed for Long Binh. The 40th and 171st Well Drilling Detachments were attached to the battalion on 31 December and the 588th was attached on 5 January. However, only the 171st had its drilling equipment. By the end of the period no equipment had been received for the 40th and 588th. On 24 January drilling was started on a series of 6 exploratory holes in Dong Ba Thin in an attempt to locate the depth at which an infiltration gallery, to serve local units, could be installed. Water was found at 17 feet, but tests revealed it to be salty. A new location, further inland, is now being explored.

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The non-availability of TOE AM radios continued to hamper communications with the outlying units. At present the company and battalion communications sections use AN/GRC-19 radios as the principle means of communication. These radios are frequently unreliable because of weather, other atmospheric conditions, and a general lack of power and range. Availability of the TOE AN/GRC-106 radios should eliminate this problem.

In planning the upgrading of Route QL-11 to a minimum standard of a single lane Class 35 road, it was found that there were a number of bridges of approximately the same length which needed replacement. A standard bridge was designed which could be easily erected with materials readily available. The design used Engineer Functional Component System structural members with a stressed timber deck. Construction of this bridge requires only about 400 man hours exclusive of abutment preparation time. A more complete report with section drawing is included as Inclosure 5.

#### **E. LOGISTICS:**

During the quarter the battalion S-4 processed more than 2200 requisitions for supplies, exclusive of PLL items. Approximately 50% of these were for construction materials including over 1,000,000 board feet of lumber, 11,000 bags of cement and 7,000 barrels of asphaltic materials. Transportation of these supplies to the companies continues to be one of the major problems faced by the battalion. Sufficient land, sea, and air assets are not available to the various transportation agencies to allow them to be completely responsive to our needs. As a result the battalion has dispatched tactical supply convoys to all the outlying job sites during the quarter in an effort to insure the timely completion of assigned projects. If it had not been for the attached bridge trucks, previously mentioned, such an operation would not have been possible and unacceptable delays on many projects would have resulted.

During this quarter significant gains were made in the maintenance program. The deadline rate has halved, ending the quarter at 10%. The battalion maintenance section continued to send contact teams to the company locations. In addition a comprehensive monthly inspection of each company's maintenance program was started. The purpose of this inspection is to assist the company commander in identifying maintenance problem areas and to insure effective administration with special emphasis on log books and repair parts requisitions and PLL. Final arrangements have been made with support units to provide local direct maintenance support for C Company at Phan Thiet.

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In an effort to lower the deadline time for direct support maintenance at remote locations the Direct Support Maintenance Battalion has authorized the battalion maintenance section to perform limited direct support maintenance.

**F. CIVIC AFFAIRS:**

The battalion has been active in Civic Action during this quarter. In the Phan Rang area, A Company installed culverts to improve irrigation of rice paddies; graded two miles of local road to allow travel by small wheeled civilian vehicles; and hauled rock fill for construction of driveways and parking areas for the Phan Rang Provincial Hospital. At Bao Loc, B Company provided equipment to level and compact the parking lot, and improve the drainage for the new Bao Loc Hospital Complex; repaired a D-4 bulldozer at the Bao Loc Agricultural College; cut and shaped road to join the new Chieu Hoi Center to existing road nets. In the village of Tanh Phat, B Company cut and graded roads and compacted rock fill for a new market place. Refugees from Tai Ninh Hamlet, which had been overrun by the Viet Cong, were relocated southwest of Duc Trong. B Company in conjunction with MACV/USAID planned a 600 by 420 meter area for a new refugee camp to which the 1215 montagnards would be located. Approximately 3 1/2 acres have been cleared using unit equipment and a surveyor has laid out the interior roads. The company medic makes daily visits to the camp to administer aid. Future plans include construction of a new aid station. At Phan Thiet, C Company assisted the new Chieu Hoi Center by clearing land, siting and digging a shallow well and hauling and placing several hundred cubic yards of fill. C Company also, collected and presented firewood to an orphanage and convent near Phan Thiet. Near Dong Ba Thin, two culverts were constructed for the entrance road to the Soui Tan orphanage. Members of Headquarters Company participated in a Christmas party at the orphanage and distributed gifts contributed by the men and their families. Weekly MEDCAP visits are being made by the battalion surgeon to villages near Dong Ba Thin. More than 100 Vietnamese civilians are being treated each month at the battalion dispensary.

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Section 2, Part I, Observations (Lessons Learned).

**OPERATIONS:**

1. **ITEM:** Requirement for sealing the base of helicopter revetments to prevent sand fill from being sucked up by the wind from the blades and damaging the aircraft engine or other components.

**DISCUSSION:** In constructing aircraft revetments all possible steps must be taken to insure that sand or earth fill is not allowed to leak out of the revetment as the high winds from the helicopter rotors will cause the particles to be drawn into the engine causing severe damage and eventual failure. A small sand-cement curb poured around the base of the revetment shown in Inclusionure 6 completely eliminated this problem.

**OBSERVATION:** A small sand-cement curb placed around the base of an otherwise sealed revetment will prevent sand or earth fill from sifting out the bottom of the revetment.

2. **ITEM:** Requirement for additional stiffening on M-4 pontons when Class 60 superstructure is used.

**DISCUSSION:** After completion of the installation of the M-4 pontons in the My Ca Float Bridge the horizontal connector pins joining the two half pontons started failing almost immediately. A study revealed several probable causes including, wave action and heavy traffic causing a high frequency of substantial fatigue stresses to be placed on the bars as each ponton tended to act independently. To reduce the frequency and magnitude of these stresses and cause a more even transfer and distribution of loads from one ponton to another a continuous double row of M4T6 balk was placed in the 1st, 2nd, 21st, and 22nd gunwale holes over the entire length of the bridge. The result has been a 75% reduction in bar breakage to a tolerable average of about 7 per week.

**OBSERVATION:** The placement of a continuous double row of balk at the outside ends of M-4 pontons has been found to be effective in reducing horizontal connector bar breakage in bridges utilizing Class 60 superstructure with the M-4 pontons.

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3. ITEM: Requirement for filtering penaprime before use.

DISCUSSION: While conducting dust palliation operations at Bao Loc Airfield, large amounts of foreign matter were discovered inside the sealed barrels. This matter, apparently introduced at time of manufacture, ranged from small clods of dirt to larger pieces of cloth. In order to prevent clogging of the distributor nozzles it was necessary to filter the penaprime. Ordinary window screening was found to be very effective and was used to filter the product as it entered the holding tank and again when it was put into the distributor.

OBSERVATION: It is necessary to filter penaprime before placing it in an asphalt distributor in order to eliminate contaminants that will clog the spray nozzles.

Section 2, Part II, Recommendations.

PERSONNEL:

1. The TOE of this battalion, as with all TOE units was designed with no additional spaces or skills to account for the normal absence of individuals on leave or R&R, or for the special requirements for security in Vietnam - in bivouac, on the job site, or when conveying supplies. If this Engineer Combat Battalion is to operate at its designed capability, and this is essential in the present situation, each space must be filled all the time. During this period the battalion has been operating at from 12 to 18 percent understrength. At this manning level the unit is well below its design effectiveness. Because of the fixed requirement for overhead personnel a 15 percent understrength represents more than a 15 percent decrease in effectiveness. This battalion, with its current missions, should be kept at full strength and preferable slightly overstrength.

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2. The G series TOE for a non-divisional engineer combat battalion (TOE 5-35G) recognizes the need for a vertical construction capability and provides for a construction section. The E series TOE 5-35E) provides for this capability with an augmentation. Either the 14th Engineer Combat Battalion MTOE under the E series should be modified to include the Combat Construction section augmentation or the unit should be organized under the G series. In the past the battalion has built cantonment areas and MER for combat units, work requiring vertical construction skills and equipment. The battalion expects to continue to be tasked for this type work.

3. The grade of a company motor sergeant in TOE 5-36G is E6. In this battalion's TOE (5-35E) he is an E5. His responsibilities for maintenance of the many and different types of vehicles and equipment and for the keeping of records under the TAERS system indicate the need for a man with more experience than offered by this grade. Therefore, a grade of E-7 is recommended in the MTOE for the E series and in the G series TOE. As an interim measure, authority should be given to establish the company motor sergeant position as an E6.

4. The S-4 section is not adequately staffed under TOE 5-35E to handle and account for the millions of board feet of lumber, thousands of drums of asphalt and bags of cement, and hundreds of tons of barrier material, culvert material, and other items used by the battalion. The MTOE should be modified, or temporary authorization given to provide an assistant S-4, and additional NCO's and yard personnel to insure that the supplies are obtained on a timely basis and are properly accounted for as required by current directives.

#### OPERATIONS:

5. During this period, as during previous reporting periods, the companies and platoons of this battalion have operated for extended periods at considerable distance from the battalion CP. Also, the road nets between units were secure and movement of most supplies required large security elements. C Company is 220 km south of Battalion, a platoon of B Company is 70 km west of the Company CP, which itself is 160 km from Battalion. This scattering of units has created several problems primarily in the areas of communications, transportation, and maintenance.

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Communications: TOE 5-35E authorizes the battalion ten (10) AN/GRC-106's, a single side-band AM radio. This battalion has been issued AN/GRC-19's in lieu of the 106. Because of weather conditions and interference from other transmissions the 19 does not permit adequate communication between battalion and the companies. This battalion's priority for issue of the AN/GRC-106 should be raised so that we have these radios as soon as possible.

Transportation: The line companies consume large quantities of Class IV material in their work. A large percentage of this material is transported by battalion. Fortunately during this period a platoon of the 553rd Engineer Float Bridge Company was attached to battalion and the twelve (12) bridge trucks were in constant use moving supplies. Without these trucks it would have been difficult to keep the companies supplied. Movement by TCMD was rarely timely because other shipments had priority. The individuals responsible for assigning TCMD priorities should be aware of the needs of the engineers. Most of our LOC work actually assists the movement of supplies. For example, a three week platoon effort on widening QL-11 as it climbs the mountain west of Song Pha reduced the convoy movement time between Phan Rang and Dalat by twenty percent.

Maintenance: With the companies at remote locations, obtaining on-site direct support maintenance on a timely basis was a problem, as was evacuation of the equipment. The battalion should be assigned the skills, given the tools, and authorized to accomplish limited direct support maintenance.

## LOGISTICS

6. A pool of selected equipment items over and above TOE authorization should be available at Group or Brigade level for issue to units on a temporary as-needed basis. Wagon drills and 600 CFM compressors could have been used on the QL-11 project described above but none were available at the time from units authorized this equipment. Items of this type should not be a part of a unit's TOE, if they are used infrequently by that unit, but if they are needed, Group or Brigade-wide, they should be available. Other units may be able to suggest additional items for this pool. Items this unit could have used on projects during this period include welding machines and a double-acting pneumatic pile hammer with compressor.

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EGACBA-C

31 January 1968

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65) for  
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7. A central pool of weapons such as .50 cal machine guns and 60 mm and 81 mm mortars should be available for issue to engineer units on a temporary, as required basis. During the recent Tet holiday each of the battalion's isolated units needed weapons of this type for its own defense. As with the equipment noted in paragraph 5 above, these weapons should not be authorized in TOE/MTOE because of their infrequent use.

*Bennett L. Lewis*

BENNETT L. LEWIS  
LTC, CE  
Commanding

5 Inclosures

- 1-Use of Functional Components System in T/O Bridging
- 2-After Action Report, Maintenance of QL-20
- 3-After Action Report, Repair of Washout on QL-11
- ~~4-After Action Report, Operation Klamath Falls~~
- ~~5-Airfield Revetments~~

Withdrawn, Hqs, DA

DISTRIBUTION:

- 3-(1 thru channels) - ACSFOR DA
- (2-w/1st Ind) - ACSFOR DA
- 2-CINC USARPAC, ATTN: GPOP-OT (AIRMAIL)
- 3-CG, USARV, ATTN: AVHOC-LH (COURIER)
- 6-CG, USAECV(P), ATTN: AVCC-P&O (COURIER)
- 1-CG, USAEC, Ft. Belvoir, ATTN: Historical Officer  
USAES, Ft. Belvoir, Va. 22060
- 5-CO, 35th Engr Gp (Const)

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EGA-CO(31 January 1968) 1st Ind Maj Luther/tb/2500  
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65) for Quarterly  
Period Ending 31 January 1968

DA, Headquarters, 35th Engineer Group (Const), APO 96312, 24 February 1968

TO: Commanding General, 18th Engineer Brigade, APO 96377

1. I have reviewed the Operational Report-Lessons Learned submitted by the 14th Engineer Battalion (Cbt) and consider it an accurate account of unit activities and accomplishments.

2. I concur with the observations and recommendations of the battalion commander with the following additional comments:

a. Section 2, Part I, Operations 2: The use of M4T6 balk was effective in reducing the number of connector pin failures experienced by the Ky Ca Float Bridge. It should be noted that the current bridge configuration is a non-standard use of M4 pontons and Class 60 superstructure.

b. Section 2, Part II, 1, Personnel: Concur with the recommendation that the 14th Engineer Battalion (Cbt) be kept at full TO&E strength. A unit which is 15% understrength has lost a finite percentage of its manpower but not necessarily a similar percentage of its effectiveness. In this command the number and type of personnel who can be on R&R or leave at any one time is controlled in order to insure the impact on the losing unit is kept to an absolute minimum.

c. Section 2, Part II, 5, Operations, Maintenance:

(1) In the past the 69th Maintenance Battalion has granted approval for the 14th Engr Bn to perform limited third echelon maintenance on a job order basis.

(2) Recently the Vinnel Corporation, Cam Ranh Bay, has instituted a program of sending contact teams to distant unit locations to render required direct support maintenance.

d. Section 2, Part II, Logistics 6: On 7 January 1968 this headquarters forwarded a list of standard and non-standard items of equipment recommended for placement in a Class IV equipment pool on Cam Ranh Bay. The 14th Engr Bn's (Cbt) comment reaffirms that a need for this pool does exist.

e. Section 2, Part II, Logistics 7: Even though extra control measures will have to be implemented to insure that large caliber weapons are not placed in the hands of men who are not trained or qualified in their use, concur with the recommendation that "weapons pools" be established. The "pools" should be administered at Engineer Battalion level and should include such items as: 50 caliber machine guns, 60 mm mortars, and 81 mm mortars.

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WGA-00 (31 January 1968)

1st Ind

Maj Luther/tb/2500

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65) for Quarterly Period Ending 31 January 1968

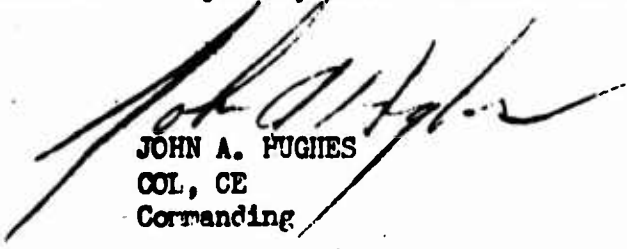
f. Inclosure 1, Use of Functional Components System in T/O Bridge

(1) This design is an excellent idea for temporary one-way bridges.

(2) Reference paragraph 2a, Stringer spacing: TM 5-312, paragraph 83 (3) states that "...stringer spacing center-to-center does not exceed 6'-0". It is interpreted by this headquarters that this restriction is only for two-lane bridges and is not applicable to one-lane bridges.

(3) Recommend that posts be incorporated into the bridge design to insure that military vehicles do not use the walkway as a travelled way. The large number of VN who use bicycles, motorbikes and Lambrettas make this a distinct possibility. Large vehicles may decide to use the walkway instead of stopping and waiting for a small vehicle to clear the bridge. Bridge failure could result from this particular loading condition.

(4) Paragraph 8: The Functional Components System bridge stringers are considerably more expensive than standard rolled sections. This headquarters does not feel that the added advantage of using the shop fabricated stringers is sufficient to justify their increased cost.

  
JOHN A. PUGHES  
COL, CE  
Commanding

cc: 14th Engr Bn (Cbt)

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AVBC-C (31 Jan 68) 2nd Ind CPT Ellegood/ltn/DBT-163  
SUBJ: Operational Report - Lessons Learned (RCS CSFCR-65) for  
Quarterly Period Ending 31 January 1968

Headquarters, 18th Engineer Brigade, APO 96377 23 FEB 68

TO: Commanding General, U.S. Army Engineer Command, Vietnam (Prov)  
ATTN: AVCC-P&O, APO 96491

1. This Headquarters has reviewed the Operational Report - Lessons Learned for the 14th Engineer Battalion, as indorsed, and considers it to be an accurate and excellent account of the Battalion's activities for the reporting period ending 31 January 1968.

2. This Headquarters concurs with the remarks of the Battalion and Group Commanders with the following comments added:

a. Reference Section 2, Part II, Item 2: The requirement to remain at current general order strength authorization necessitated the requirement to delete the 26 man combat construction section in the standardized MTOE 5-36G submitted in October 1967. Therefore this section will not be added if and when the 14th Engineer Battalion is re-organized under the presently submitted MTOE 5-36G.

b. Reference Section 2, Part II, Item 3: The Motor Sergeant in grade E-6 is authorized in TOE 5-36G and TOE 5-37G which have been published. Standardized MTOE's 5-36G and 5-37G also include Motor Sergeants in the grade E-6

c. Reference Section 2, Part II, Item 4: Additional personnel were incorporated into the S-4 section of MTOE 5-36G based on requirements established by field experience.

d. Reference Section 2, Part II, Item 5, Transportation: Procedures are established whereby the unit places the priority needed on the TCND. If faster action is needed, the unit may request a combat essential priority from this Headquarters.

e. Reference Section 2, Part II, Item 5, Maintenance, and Paragraph 2c of the first indorsement: While consideration will be given to adding a direct support maintenance capability to the Engineer Combat Battalion during the next MTOE action, every effort must be taken to make the existing system work properly. The direct support maintenance unit has contract teams available for the express purpose of providing support at isolated locations. In addition, the performance of limited direct support on a "self-help" basis under the conditions described in the first indorsement will help to expedite the necessary repairs.

f. Reference Section 2, Part II, Item 6 and Paragraph 2d of the first indorsement: A class IV equipment pool has been

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AVBC-C (31 Jan 68)

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65) for  
Quarterly Period Ending 31 January 1968

recommended for establishment in each Group AOR.

g. Reference Section 2, Part II, Item 7 and Paragraph 2c of the first indorsement: It is felt that the training required and the control measures necessary to effectively use indirect fire weapons such as mortars may preclude the inclusion of these weapons in a weapons pool. On the other hand, if they were assigned as TOE equipment at the battalion or company level, the unit commander can train mortar crews and can establish effective fire control techniques. Indirect fire weapons will be considered for inclusion in the next MTOE action.

*Harold J. St. Clair*  
HAROLD J. ST CLAIR  
Colonel, CE  
Deputy Commander

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AVCC-P&O (31 Jan 68) 3rd Ind  
SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65) for Quarterly  
Period Ending 31 Jan 68

HEADQUARTERS, UNITED STATES ARMY ENGINEER COMMAND  
VIETNAM (PROV), APO 96491 **18 MAR 1968**

TO: Commanding General, United States Army Vietnam, ATTN: AVHGC-DST,  
APO 96375

The attached ORLL, submitted by the 14th Engineer Battalion (Combat),  
has been reviewed by this headquarters and is considered adequate except  
as follows:

Item concerning MTOE, Section 2, Part II, paragraph 3, page 13. MTOE  
5-36G has been submitted to DA. If approved, it will authorize the transition  
from TOE 5-35E to 5-36G. The authorized grade of the motor sergeant in the  
5-36G TOE is SFC(E-7).

FOR THE COMMANDER:

*John Thutomb* 1LT, AGC  
for RICHARD B. BIRD  
Captain, AGC  
Assistant Adjutant General

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This Protective Marking is Canceled on **2 JAN 1970**



AVHGC-DST (31 Jan 68)

4th Ind

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65) for  
Quarterly Period Ending 31 January 1968

HEADQUARTERS, US ARMY VIETNAM, APO San Francisco 96375 23 MAR 1968

TO: Commander in Chief, United States Army, Pacific, ATTN: GPOP-DT,  
APO 96558

1. This headquarters has reviewed the Operational Report-Lessons Learned for the quarterly period ending 31 January 1968 from Headquarters, 14th Engineer Battalion (Combat) (Army) (WAZOAA) as indorsed.

2. Concur with report as indorsed. Report is considered adequate.

3. A copy of this indorsement will be furnished to the reporting unit through channels.

FOR THE COMMANDER:



CHARLES A. BYRD  
Major, AGC  
Assistant Adjutant General

Copies furnished:

HQ 14th Engr Bn (Cbt)(Army)

HQ USAECV(P)

GPOP-DT (31 Jan 68) 5th Ind

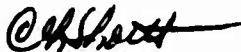
SUBJECT: Operational Report of HQ, 14th Engr Bn (Cbt) (Army) for  
Period Ending 31 January 1968, MCS CSFOR-65 (R1)

HC, US Army, Pacific, APO San Francisco 96558 12 APR 1968

TO: Assistant Chief of Staff for Force Development, Department of the  
Army, Washington, D. C. 20310

This headquarters has evaluated subject report and forwarding indorse-  
ments and concurs in the report as indorsed.

FOR THE COMMANDER IN CHIEF:



C.L. SHORTT  
CPT, AGC  
Asst AG

7

## USE OF FUNCTIONAL COMPONENTS SYSTEM IN T/O BRIDGING

### 1. GENERAL

In programming the upgrading of National Highway L-11 to a minimum one-lane, Class 35 road, it was found that there were a number of bridges of roughly the same length which would need replacement. This observation led to the effort to develop a standard bridge design which would be useable at several locations. Research on available materials disclosed that certain pieces of Engineer Functional Components System bridging were in stock. These parts did not constitute the materials for a complete bridge, but it appeared that they could be used in the construction of a number of bridges.

### 2. DESIGN

The objectives of the design for a single lane, Class 35 bridge were:

- a. Economy of materials
- b. Minimum transportation and handling requirements for materials.
- c. Simplicity of erection.
- d. Minimum on-site fabrication of components.

To achieve these objectives, it was felt that an integrated structure which would develop the strength of all materials to the fullest extent possible would be the basis of a light, easily transported bridge. The final design varies considerably from some of the precepts of normal T/O engineering, specifically:

- a. The bridge was designed to use only two steel stringers, spaced 10'-0" on center.
- b. The deck was designed to accept stresses in the direction perpendicular to the axis of the planks. This was accomplished by laminating the deck of 2 x 8 material, with each board nailed to the next, roughly as specified for the laminated deck in the EFCS bridge design. In laminated decking of this kind, accepted engineering practice allows considering the distribution of applied stresses over 15 inches of deck length. Analysis of the stress developed in a segment of deck 8 inches by 15 inches indicated the deck was suitable as designed.

Incl 1

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2

Diaphragm bracing in the two stringer bridge is critical to the stability of the structure. Diaphragm components were available, and the bracing is installed according to the EFCS design. The extended stringer spacing meant cutting the 18 inch channel diaphragm from 26 foot end pieces rather than the standard 4'-6" parts.

The roadway and curb and handrail system are standard timber bridge design.

### 3. CONSTRUCTION

The first bridge constructed according to the design presented few problems to the constructing unit. The bridge was set on existing abutments, and exclusive of abutment preparation time, placing the bridge required approximately 400 manhours, with a work force of about 15 men.

### 4. CONSTRUCTION PROBLEMS

Some problems were encountered with the first bridge:

- a. The diaphragms were built in the shop by cutting the channel sections to length and welding lengths of 7" Structural Tee to the ends. Quality control in this phase of prefabrication was difficult. Welding the tee sections caused them to warp, and minor variations in the length of the diaphragms were inevitable. This problem has been circumvented by drilling and bolting this connection.
- b. It was found that keeping the planks of the deck standing plumb was difficult to achieve. A multiplication of error in the dimensions of the planking was the cause. Although a slight tipping of the decking is aesthetically bothersome, if limited, this variation will not affect the strength of the deck. Gross errors, which would have an adverse effect on the strength of the bridge, can be prevented by carefully rotating the direction of warp in the planks, neutralizing the cumulative error.

### 7. CONCLUSIONS

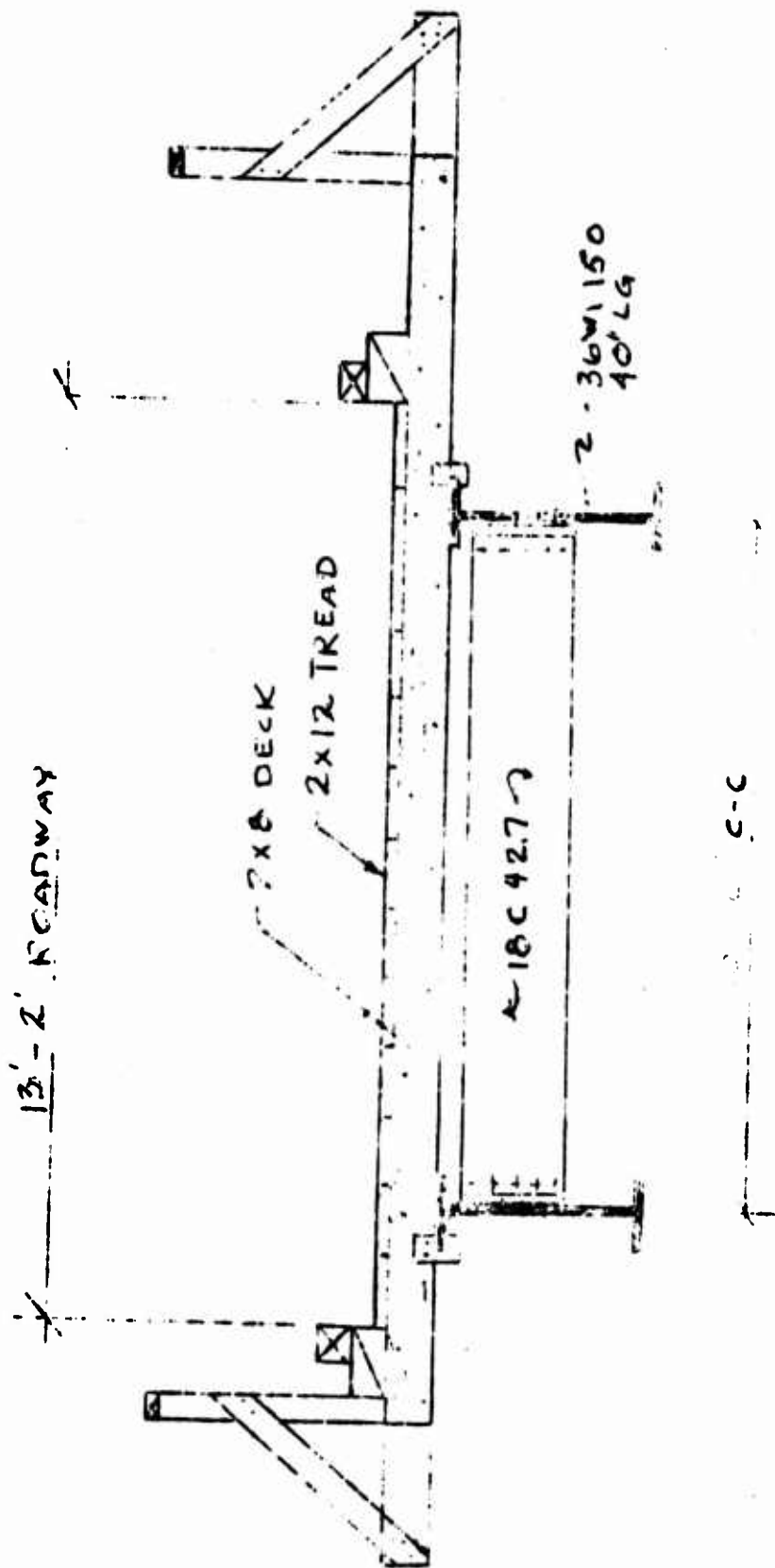
The two stringer bridge meets the design objectives in the following particulars:

- 9
- a. **Economy of Materials.** The bridge was compared with the standard timber bridge previously used. A reduction of 40% in the number of vehicles required to transport materials, and a reduction of 25% in the dollar cost per foot of bridge were realized.
  - b. **Minimum Transportation and Handling Requirements for Materials.** Transportation savings are mentioned above. This bridge contains six pieces per span which must be placed with a crane, as compared with approximately twenty pieces for an equivalent length of timber bridge.
  - c. **Simplicity of Erection.** The structural frame requires a minimum of skilled labor for erection, and quality control is high due to the simplicity of the bolted connections and prefabricated parts.
  - d. **Minimum On-Site Fabrication of Components.** If required by job site conditions, all parts for the bridge may be prefabricated prior to moving to the job site, leaving only nailing and bolting to be done.
  - e. **Interchangeability of Components and Flexibility of Employment.** All components are interchangeable due to shop control of all critical dimensions. This allows segregated fabrication and stockpiling of components. The internal rigidity of the structure allows employment with a minimum of abutment preparation and site work for a wide range of span lengths.

No bridge built according to this design has been in place long enough to determine how it will withstand the punishment of constant military traffic. Durability is expected to be high due to the rigidity and structural integrity of the design. The use of a non-flammable frame is a considerable advantage in areas where the enemy pursues a harassing pattern of bridge destruction.

## 8. RECOMMENDATIONS

It is recommended that continuous restocking of Functional Components System bridge parts be established at the depot level. It has been shown that these materials have wide application in T/O construction.



SECTION  
 SUPERSTRUCTURE ~ 40' CA. CLASS 35 BRIDGE  
 $\frac{3}{8}" = 1' - 0"$

FIGURE 1

DEPARTMENT OF THE ARMY  
HEADQUARTERS, 11TH ENGINEER BATTALION (COMBAT) (ARMY)  
APO 96377

EGACBA-C

31 December 1967

SUBJECT: After Action Report, Maintenance of QL-20

TO: Commanding Officer  
35th Engineer Group (Const)  
ATTN: EGA-3  
APO 96312

1. After Action Report on Maintenance of QL-20 is submitted in accordance with letter, 35th Engineer Group (Const), dated 9 May 1967.

2. Name of Operation: Maintenance of QL-20.

3. Dates of Operation: 17 November 1967 to 11 December 1967.

4. Location: Vicinity Dai Quay, RVN.

5. Command Headquarters: 23rd Engineer Battalion, ARVN.

6. Task Organization:

a. Organic Units: 2nd and 3rd Platoons, Company B, 11th Engineer Battalion.

b. Attachments:

(1) 3 Equipment Operators, Company D, 11th Engr Bn (Cbt)

(2) 1 Equipment Operator, 87th Engr Bn (Const)

(3) 2 Equipment Operators, 572nd Engr Co (LE)

(4) 1 Equipment Operator, 864th Engr Bn (Const)

(5) 4 Water Point Personnel, HHC, 11th Engr Bn (Cbt)

c. Detachments: None

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31 December 1967

SUBJECT: After Action Report, Maintenance of QL-20

d. Support Forces: Elements of the 445th Infantry Battalion, ARVN, provided security for the operation.

7. Intelligence: Reports indicated an estimated enemy force of 2000 men was operating in the area. Enemy activity included nuisance mining, harassing fire, and deliberate ambushes along QL-20. The largest enemy force contacted by US personnel was estimated to be platoon size.

8. Mission: To improve a portion of Highway QL-20 south of the city of Bao Loc, RVN, to include pot-hole repair, shaping, cutting, and clearing of side ditches, grading of the road, and limited land clearing.

9. Concept of Operations:

a. Planning Phase: The 14th Engineer Battalion (Cbt) conducted aerial and ground reconnaissance of the project site to determine equipment and personnel requirements, and coordinated with MACV to arrange for security forces and a bivouac area adjacent to the Dai Quay Compound. Planning also required coordination between the 14th Engineer Battalion (Cbt) and the ARVN Engineers working concurrently on an adjacent section of the road. The 23rd ARVN Engineer Battalion maintained overall supervisory and planning responsibility for the job.

b. Mobilization Phase: Movement from Bao Loc to Dai Quay via Highway QL-20, a distance of approximately 22 kilometers, was accomplished in successive convoys during the period 17-19 November 1967. Security for all convoy movements was provided by elements of the 445th Infantry Battalion, ARVN. On 11 December 1967 the work force returned to Bao Loc in convoy.

10. Execution:

a. Starting Date: 17 November 1967  
Completion Date: 1 December 1967

b. The initial phase of the work consisted of road improvement west of Dai Quay. Approximately 8500 meters of the road were shaped, and badly rutted areas were filled with rock and sand. Ditches were cleared and shaped, and one 30 foot section of 36" culvert was installed. When the ARVN and US Engineer units had completed repairs on the road between Dai Quay and Madagui, to the west, the 14th Engineer Battalion elements shifted to the east of Dai Quay, repairing approximately 4 kilometers of QL-20 towards Bao Loc. This work included repairs as above, and widening the



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31 December 1967

SUBJECT: After Action Report, Maintenance of QL-20

road by 4 feet for  $\frac{1}{2}$  kilometer. 70 feet of 36" culvert were installed. Additional requirements were then received to continue the project south of the II/III CTZ border. A fill stockpile was established near the border, and another 6 kilometers of QL-20 were improved to the south by filling ruts and potholes, and grading. Land clearing for a distance of 10 meters back from the road was accomplished along portions of the road during the project. The work south of the II/III CTZ border was completed on 10 December 1967.

c. Pictorial Coverage: Attached

11. Results:

a. Enemy Personnel Losses: 2 known KIA

b. Friendly Personnel Losses: 1 U.S. KIA, 1 U.S. WIA, 7 ARVN KIA, 6 ARVN WIA, 1 ARVN AD.

c. Enemy Equipment Captured: UNK

d. Friendly Equipment Losses: 1 PRC-25, OVM tools

e. Kilometers Road Improved: 18.5  
Culverts Installed: 100 LF 36" culvert

f. Highway QL-20 was made passable to civilian commercial traffic, with the reported result of a general lowering of produce prices in the Saigon area.

12. Administration and Logistics:

a. Rations: Rations were provided by airlift to the bivouac area.

b. Medical: One medic accompanied the work force.

c. Transportation: Convoy movements to and from Dai Quay, and daily transportation to work sites, was by organic and attached vehicles. Helicopter air transport was utilized on resupply missions and for transportation of key personnel to and from Bao Loc.

d. Construction Materials: All construction materials were supplied by 14th Engineer Battalion (Cbt).

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31 December 1967

SUBJECT: After Action Report, Maintenance of QL-20

e. Quarters: TO&E tentage was utilized for billeting during the operation.

f. POL POL requirements during the operation were met by air transport and resupply convoy.

13. Special Equipment and Logistics:

a. Man Hours: 8,128

b. Equipment Hours: 1,438

c. Materials Expended: 36" metal culvert - 100 LF

14. Analysis and Lessons Learned: The price in friendly personnel losses for this project was high. This would seem to indicate the importance to the enemy of discouraging Revolutionary Development projects of this kind.

It was found during the course of the work that the deteriorated condition of the road was partly caused by existing drainage structures which had become overgrown and clogged. This condition, however, was repairable. Old French culverts were cleared with considerably less effort than that necessary to replace them. The conclusion is that in repair work of this kind, effort expended to restore original work can be the most expeditious course of action, especially where time is a limiting factor, and a careful survey of existing structures will be well repaid in time saved.

A significant delay factor in the project was the extreme difficulty encountered in coordinating security for work across the II/III CTZ border. Requirements for the work south of the border were received after the job was well under way. The problem can be avoided in the future by improving the means of interprovincial security arrangements and earlier development of requirements.

15. Recommendations: The friendly losses incurred in this project were the result of deliberate enemy ambushes and sniper fire. The available concealment in the heavily overgrown area increased the opportunity for this type of activity. It is recommended that full scale clearing operations be conducted concurrently with road work to improve security both during the operation and when the job is completed.

FOR THE COMMANDER:

JAMES L. FLEMING  
1LT, AGC  
Adjutant

DEPARTMENT OF THE ARMY  
HEADQUARTERS, 14TH ENGINEER BATTALION (COMBAT) (ARMY)  
APO 96377

EGACBA-C

13 January 1968

SUBJECT: After Action Report, Repair of Washout on QL-11

TO: Commanding Officer  
35th Engineer Group (Const)  
ATTN: EGA-3  
APO 96312

1. After action report on Repair of Washout on QL-11 is submitted in accordance with letter, 35th Engineer Group (Const), dated 9 May 1967.
2. Name of Operation: Repair of Washout on QL-11
3. Dates of Operation: 1 December 1967 to 14 December 1967.
4. Location: Vicinity coordinates BP 467098.
5. Command Headquarters: 14th Engineer Battalion (Combat)
6. Task Organization:
  - a. Organic Units: 3rd Platoon, Company A, 14th Engr Bn (Cbt)
  - b. Attachments: None
  - c. Detachments: None
  - d. Supporting Forces: Elements of the 610th Engineer Company (CS) and the 92nd Assault Helicopter Company.
7. Intelligence: The operation was conducted in a relatively secure area. Reports were received of enemy movement in the area, and sniper fire was received by one helicopter.
8. Mission: To re-open Highway QL-11 from coordinates BP 469099 to BP 466097 where the roadway had been destroyed by a washout.

Incl 3

EGACBA-C

13 January 1968

SUBJECT: After Action Report, Repair of Washout on QL-11

## 9. Concept of Operations:

a. Planning Phase: The washout had occurred when two large diameter water conduits burst. Aerial reconnaissance of the site was made the day following the washout to assess the damage, and this was followed by a ground reconnaissance to determine material and equipment requirements for repairing the road. A preliminary estimate of the situation indicated at least one temporary bridge would be required, and plans were made accordingly. It was estimated at this time that the repair would require approximately one month's work. On 1 December 1967, 3rd Platoon, Company A, 14th Engineer Battalion (Cbt) conducted an on-site reconnaissance to establish security arrangements with local forces and locate a bivouac area. Final planning for work was done on 3 December by the platoon leader while the bivouac site was being developed.

b. Mobilization Phase: At 0830 hrs, 2 December 1967, the 3rd Platoon departed Dalat in convoy for the job site. Security was provided internally, with air cover by a F4C from Dalat. The platoon reached the bivouac site, coordinates BP 453084, at 1330 hrs, 2 December 1967. At the completion of the job the platoon moved to Phan Rang by convoy. This movement took place on 14 December 1967.

## 10. Execution:

a. Starting Date: 1 December 1967

Ground and Aerial Reconnaissance: 1-3 December 1967

Start of Work: 4 December 1967

Road Open to Military Traffic: 10 December 1967

Completion Date: 13 December 1967

Constructing Unit Extracted: 14 December 1967

b. The period 2-3 December was spent in planning for work and preparing a bivouac near the job site. A defensive perimeter was established using triple standard concertina wire. Bunkers, a latrine, motor pool office, field kitchen and tents completed the camp, and a CH-47 capable landing zone with access road was cleared.

EQACBA-C

13 January 1968

SUBJECT: After Action Report, Repair of Washout on QL-11

On the morning of 4 December 1967, work on the washout began with blasting to break up the large boulders which blocked the road. The rock was cleared by hand, the road being impassable to the dozer.

During the preliminary stages of the job it was felt that a bridge would be necessary at the upper washout. As the work progressed it appeared feasible to construct a bypass by cut and fill. A requirement that the road be open to military convoy traffic on 10 December 1967 made the development of a bypass imperative, as the time required to transport bridge materials to the site would have prevented meeting the deadline.

At 1200 hours, 6 Dec, the platoon was organized in two work parties to allow 24 hour operation. For the next 48 hours the two shifts drilled and blasted the upper washout, cutting a bypass into the hill. At the end of that time the upper washout was passable to the dozer, which was then employed in clearing the road of rock and silt which had been deposited by the flood.

Clearing of the roadway and improvement of the bypass continued until 1000 hours, 10 December 1967, when the 3rd platoon met a company of the 87th Engineer Battalion which had started work on the washouts at the base of the slope and worked uphill. At that time the road was reported open to military traffic.

Two more days were spent improving the bypass with the installation of a permanent culvert with concrete headwalls and splash pad, improvement of curve alignment, and further work on the road surface. The job was completed on 13 December, and the platoon moved to the A Company, 11th Engineer Battalion, base camp at Phan Rang on the next day.

c. Pictorial Coverage: Attached

#### 11. Results:

- a. Enemy Personnel Losses: None
- b. Friendly Personnel Losses: None
- c. Enemy Equipment Captured: None
- d. Friendly Equipment Losses: None

EG/CEB/-C

13 January 1968

SUBJECT: After Action Report, Repair of Washout on QL-11

- e. Kilometers of Road Repaired: Approximately 1 kilometer.  
Culverts Installed: 72 linear feet of 12" culvert.

f. Highway QL-11 was opened to traffic on the twelfth day after the failure of the penstock had washed out the road.

## 12. Administration and Logistics:

a. Rations: All rations were delivered to the bivouac site by airlift.

b. Transportation: Convoy movements to and from the job were by organic vehicles. Air logistical support to the project by the 92nd Assault Helicopter Company also provided transportation for command elements throughout the job.

c. Construction Materials: Maximum use was made of local materials. Blast rock from clearing operations was utilized to construct the bypass roadway. After the road was opened, additional construction materials were transported to the site by convoy.

d. Quarters: TO&E tentage was employed for shelter.

## 13. Special Equipment and Logistics:

a. Man Hours: 3090

b. Equipment Hours: 162 (1-Air compressor, 1-D7, 1 Front Loader  
3-5 ton dumps)

c. Materials Expended: 12" culvert 72 linear feet  
Military Dynamite 550 pounds

## 14. Analysis and Lessons Learned:

This job served to demonstrate several basic premises of T/O engineering in Vietnam. The washout was apparently not the result of enemy activity, but nevertheless had a serious effect on the tactical and logistic situation in the area. The continuing requirement for engineer reaction forces in maintenance of Lines of Communication was amply demonstrated. The timely completion of this task resulted from the rapid deployment of a combat engineer platoon to the job site, and the airlift supply line, which obviated time consuming resupply convoys over relatively insecure roads.

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13 January 1968

SUBJECT: After Action Report, Repair of Ashout on QL-11

The use of available materials in constructing a permanent bypass reduced the logistical problem to an acceptable minimum, and greatly speeded the work. At the same time, maximum demands were made on the resourcefulness of the platoon leader. By successful manipulation of available manpower and equipment the job was completed rapidly with no loss in quality of work.

FOR THE COMMANDER:

*James L. Fleming*  
JAMES L. FLEMING  
1LT, AGC  
Adjutant

UNCLASSIFIED

Security Classification

## DOCUMENT CONTROL DATA - R &amp; D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) OACSFOR, DA, Washington, D.C. 20310		2a. REPORT SECURITY CLASSIFICATION For Official Use Only	
		2b. GROUP	
3. REPORT TITLE Operational Report - Lessons Learned, Headquarters, 14th Engineer Battalion (Cbt) (A)			
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) Experiences of unit engaged in counterinsurgency operations. 1 Nov 67-31 Jan 1968			
5. AUTHOR(S) (First name, middle initial, last name) CO, 14th Engineer Battalion			
6. REPORT DATE 31 January 1968		7a. TOTAL NO. OF PAGES 36	7b. NO. OF REFS
8a. CONTRACT OR GRANT NO.		9a. ORIGINATOR'S REPORT NUMBER(S) 681276	
b. PROJECT NO. N/A		9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)	
c.			
d.			
10. DISTRIBUTION STATEMENT			
11. SUPPLEMENTARY NOTES N/A		12. SPONSORING MILITARY ACTIVITY OACSFOR, DA, Washington, D.C. 20310	
13. ABSTRACT			

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DD FORM 1473  
1 NOV 66

UNCLASSIFIED

Security Classification